

REMARKS

This Amendment is filed in response to the Office Action dated June 23, 2006. This application should be allowed and the case passed to issue. No new matter is raised by this amendment. The amendment to claim 1 is supported by the specification at page 14, lines 21-23.

Claims 1-20 are pending in this application. Claims 1-5 and 11-20 have been rejected. Claims 6-10 were withdrawn pursuant to a restriction requirement. Claim 1 has been amended.

Objections to the Specification

The Abstract of the Disclosure was objected to as being longer than a single paragraph. This objection is traversed, and reconsideration and withdrawal respectfully requested.

A new Abstract of the Disclosure is included in this response.

Double Patenting

The Examiner noted that a double patenting rejection between this application's pending claims and the pending claims of copending application 10/765,208 was made in paragraph 6 of the Office Action mailed February 23, 2006 in copending application 10/765,208.

As a double patenting rejection was not made in this application, but rather, was made in copending application 10/765,208, this issue has been addressed in a response filed May 23, 2006 in copending application 10/765,208.

Claim Rejections Under 35 U.S.C. § 102

Claims 1, 13, 14, 17, 18, and 20 were rejected under 35 U.S.C. § 102(b) as being anticipated by Lambeth et al. (WO 99/24973). The Examiner asserted that Lambeth et al. disclose a perpendicular magnetic recording medium comprising a non-magnetic substrate, a layer stack (page 51, lines 9-11) comprising a magnetically soft underlayer (NiFe), a non-magnetic interlayer structure (Ag(111)/Ti(0002), and a perpendicular magnetic recording layer.

The Examiner further averred that Lambeth et al. disclose that Au and Ag are taught as suitable fcc materials (page 16, lines 7-20).

Claims 1-5 and 11-20 were rejected under 35 U.S.C. § 102(a) and/or (e) as being anticipated by Abarra et al. (U.S. Pat. Pub. No. 2003/0186086). The Examiner asserted that Abarra et al. disclose a perpendicular magnetic recording medium comprising a non-magnetic substrate, a layer stack (Fig. 13, Ref. No. 51) comprising a magnetically soft underlayer (61), a non-magnetic interlayer structure (62/53/54/55), and a recording layer (56). The Examiner further averred that Abarra et al. disclose a layer comprising fcc Au-containing non-magnetic material having a <111> preferred growth orientation (paragraphs 0070-0073 and 0077).

Claims 1-5, 11-13, 17, and 20 were rejected under 35 U.S.C. § 102(e) as being anticipated by Yamamoto et al. (U.S. Pat. Pub. No. 2004/0043258). The Examiner asserted that Yamamoto et al. disclose a perpendicular magnetic recording medium comprising a non-magnetic substrate (10), a layer stack (Fig. 1) comprising a magnetically soft underlayer (11), and a non-magnetic interlayer structure (12, 13), and a recording layer (14). The Examiner further averred that Yamamoto et al. disclose a layer comprising fcc Au-containing non-magnetic material having a <111> preferred growth orientation (paragraphs 0014 and 0015).

These rejections are traversed and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

An aspect of the present invention, per claim 1, is a perpendicular magnetic recording medium comprising a non-magnetic substrate having a surface and a layer stack formed over the substrate surface. The layer stack comprises, in overlying sequence from the substrate surface, a magnetically soft underlayer, a non-magnetic interlayer structure, and a magnetically hard

perpendicular main recording layer. The non-magnetic interlayer structure is selected from the group consisting of a structure comprising a layer of a *fcc* Au-containing non-magnetic material having a $\langle 111 \rangle$ preferred growth orientation and a layer comprising Ru in overlying or underlying contact with the layer of *fcc* Au-containing non-magnetic material; a structure comprising, in overlying sequence, a layer of a *fcc* Au-containing non-magnetic material adjacent the magnetically soft underlayer and having a $\langle 111 \rangle$ preferred growth orientation, and n layers of a different *fcc* non-magnetic material having a $\langle 111 \rangle$ preferred growth orientation, where $n = 1 - 5$; a structure comprising, in overlying sequence, a layer of a *fcc* Au-containing non-magnetic material adjacent the magnetically soft underlayer and having a $\langle 111 \rangle$ preferred growth orientation, n layers of a different *fcc* non-magnetic material having a $\langle 111 \rangle$ preferred growth orientation, where $n = 1 - 5$; and n layers of a *hcp* non-magnetic material having a $\langle 0002 \rangle$ preferred growth orientation, where $n = 1 - 5$, and an $(fcc)_1/(hcp)_1/(fcc)_2/(hcp)_2$ structure comprising, in overlying sequence, a first *fcc* layer $(fcc)_1$, a first *hcp* layer $(hcp)_1$, a second *fcc* layer $(fcc)_2$, and a second *hcp* layer $(hcp)_2$, wherein at least the first *fcc* layer is an Au-containing non-magnetic material.

Lambeth et al., Abarra et al., and Yamamoto et al. do not anticipate the elected species of perpendicular magnetic recording medium because Lambeth et al., Abarra et al., and Yamamoto et al. do not disclose a layer stack comprising, in overlying sequence from the substrate surface, a magnetically soft underlayer, a non-magnetic interlayer structure, and a magnetically hard perpendicular main recording layer, wherein the interlayer structure comprises of a layer of a *fcc* Au-containing non-magnetic material having a $\langle 111 \rangle$ preferred growth orientation and a layer comprising Ru in overlying or underlying contact with the layer of *fcc* Au-containing non-

magnetic material, as recited in claim 1. Lambeth et al., Abarra et al., and Yamamoto et al. do not disclose the claimed Ru layer.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Lambeth et al., Abarra et al., and Yamamoto et al. do not disclose a layer stack comprising, in overlying sequence from the substrate surface, a magnetically soft underlayer, a non-magnetic interlayer structure, and a magnetically hard perpendicular main recording layer, wherein the interlayer structure comprises of a layer of a *fcc* Au-containing non-magnetic material having a $\langle 111 \rangle$ preferred growth orientation and a layer comprising Ru in overlying or underlying contact with the layer of *fcc* Au-containing non-magnetic material, as recited in claim 1, Lambeth et al., Abarra et al., and Yamamoto et al. do not anticipate claim 1.

Rejections Under 35 U.S.C. § 103

Claims 1-5 and 11-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Abarra et al. The Examiner acknowledged that Abarra et al. fail to explicitly disclose selecting Au or Au-X from the list of fcc materials. The Examiner, however, averred that Abarra et al. disclose alloying Au with Al₃Ti. The Examiner asserted that it would have been obvious to use a material meeting the claimed composition to provide a more uniform lattice for the magnetic

layer to grow on, and that Au, Cu, Ag, Pt, Pd, etc. were equivalents in the field of elements capable of being alloyed with Al₃Ti and still result in a fcc <111> crystal orientation.

Claims 1-5 and 11-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Abarra et al. in view of Yamamoto et al. The Examiner acknowledged that Abarra et al. fail to explicitly disclose selecting Au or Au-X from the list of fcc materials. The Examiner, however, averred that Yamamoto et al. illustrate the Cu-X alloy and teach that Au is a suitable equivalent to Cu as a fcc based material (paragraph 0019).

Claims 14-16, 18, and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto et al. in view Abarra et al. The Examiner acknowledged that Yamamoto et al. fail to disclose the specifics of the recording medium. The Examiner maintained that Abarra et al. teach the claimed magnetic layer thickness, the amorphous layer, and adhesion layer, and that the recited layers and thickness would have been obvious.

These rejections are traversed, and reconsideration and withdrawal respectfully requested.

Lambeth et al., Abarra et al., and Yamamoto et al., whether taken alone, or in combination, do not suggest the elected species of perpendicular magnetic recording medium because the cited references do not suggest a layer stack comprising, in overlying sequence from the substrate surface, a magnetically soft underlayer, a non-magnetic interlayer structure, and a magnetically hard perpendicular main recording layer, wherein the interlayer structure comprises of a layer of a *fcc* Au-containing non-magnetic material having a <111> preferred growth orientation and a layer comprising Ru in overlying or underlying contact with the layer of *fcc* Au-containing non-magnetic material, as recited in claim 1. Lambeth et al., Abarra et al., and Yamamoto et al. do not suggest the claimed layer comprising Ru.

Obviousness can be established only by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine*, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). There is no motivation in Lambeth et al., Abarra et al., and Yamamoto et al. to substitute an interlayer structure comprising of a layer of *fcc* Au-containing non-magnetic material having a <111> preferred growth orientation and a layer comprising Ru in overlying or underlying contact with the layer of *fcc* Au-containing non-magnetic material into the magnetic recording media of Lambeth et al., Abarra et al., or Yamamoto et al. to provide the magnetic recording medium according to the elected species recited in claim 1.

The only teaching of the perpendicular magnetic recording medium comprising a layer stack comprising, in overlying sequence from the substrate surface, a magnetically soft underlayer, a non-magnetic interlayer structure, and a magnetically hard perpendicular main recording layer, wherein the interlayer structure comprises a layer of a *fcc* Au-containing non-magnetic material having a <111> preferred growth orientation and a layer comprising Ru in overlying or underlying contact with the layer of *fcc* Au-containing non-magnetic material, is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The dependent claims further distinguish the claimed invention and are allowable for at least the same reasons as claim 1.

Applicants submit that the non-elected species of the claimed perpendicular magnetic recording medium are allowable because the cited references do not suggest a layer stack comprising, in overlying sequence from the substrate surface, a magnetically soft underlayer, a non-magnetic interlayer structure, and a magnetically hard perpendicular main recording layer, wherein the interlayer structure is selected from the group of in overlying sequence, a layer of a *fcc* Au-containing non-magnetic material adjacent said magnetically soft underlayer and having a $\langle 111 \rangle$ preferred growth orientation, and n layers of a different *fcc* non-magnetic material having a $\langle 111 \rangle$ preferred growth orientation, where $n = 1 - 5$; a structure comprising, in overlying sequence, a layer of a *fcc* Au-containing non-magnetic material adjacent said magnetically soft underlayer and having a $\langle 111 \rangle$ preferred growth orientation, n layers of a different *fcc* non-magnetic material having a $\langle 111 \rangle$ preferred growth orientation, where $n = 1 - 5$; and n layers of a *hcp* non-magnetic material having a $\langle 0002 \rangle$ preferred growth orientation, where $n = 1 - 5$; and an $(fcc)_1/(hcp)_1/(fcc)_2/(hcp)_2$ structure comprising, in overlying sequence, a first *fcc* layer $(fcc)_1$, a first *hcp* layer $(hcp)_1$, a second *fcc* layer $(fcc)_2$, and a second *hcp* layer $(hcp)_2$, wherein at least the first *fcc* layer is an Au-containing non-magnetic material, as recited in claim 1.

Thus, Applicants respectfully request rejoinder, examination, and allowance of the withdrawn species upon the allowance of species I.

In view of the above amendments and remarks, Applicants submit that this case should be allowed and passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

Application No.: 10/776,222

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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